certain subdivisions would sufficiently indicate the contents of the paper, and in the case above cited this is partially true; but take the paper numbered 738 and compare its title with those under the various sections (they are too long to quote), and the value of the additional titles will be at once appreciated.

Of recent years our knowledge of organic chemistry has increased so rapidly that it might be difficult to know under which registration number to look for some of the organic compounds, and chemists will be thankful to the Central Bureau for giving a list of organic bodies and their registration numbers extending over nearly sixteen pages in double columns and containing some 1800 references.

It may be thought that the mode of using the registration numbers would be very difficult to acquire, but it is surprising how rapidly one becomes accustomed to their employment after a little practice. It cannot be said that the schedules as they now stand are perfect, but when they are revised in 1905 many emendations will doubtless be made.

We must be thankful to the Central Bureau for the care and accuracy with which this volume has been compiled, and we must congratulate chemists on having another instrument of research at their disposal.

HERBERT MCLEOD.

ANOTHER THEORY OF SEX.

Qu'est-ce qui détermine le Sexe? Par le Docteur A. Van Lint, Médecin Assistant à l'Hôpital Saint-Pierre, à Bruxelles. Pp. 77. (Paris: Baillière et Fils, 1902.)

DR. A. VAN LINT has convinced himself of the validity of a somewhat extraordinary new theory as to the determination of sex, which is in some measure a rejuvenescence of Starkweather's. If it is true, it should give pause to virile fathers who wish to have sons, for unless they can secure still more vigorous mates they are sure to have daughters only. The theory is, that the offspring follow the sex of the weaker parent, though, as we read on, this turns out to mean the parent whose available germ-cells are relatively less vigorous at the time of fertilisation. But an attempt to estimate the relative vigour of germ-cells leads us into the region of the unverifiable.

To understand the author aright we must note that he does not believe in the concept of the germ-plasm ("pour nous, les cellules génitales se développent tout entières aux depens des cellules somatiques," p. 34), and that he postulates the origin of the unisexual organism from primitive hermaphroditism, a tendency to which always persists in more or less subtle guise. We cannot within our limits argue about these postulates, but we cannot agree with either. It is very interesting to compare van Lint's views with those stated by Dr. John Beard in his paper on the determination of sex, also published this year.

Van Lint's new theory is a coordination of five hypotheses, which he expounds in a lucid and suggestive manner:—(1) The ovum and the spermatozoon are antithetic, expressing opposite extremes of cellular differentiation, and perhaps analogous to right-handed and left-handed crystals of the same stuff. (2) There is also a somatic antithesis between the masculine body and the feminine body, often conspicuous in the so-called secondary sex-characters, often inconspicuously expressed in minute contrasts which saturate the whole soma. (3) Again, there is an antithesis between the character of the germ-cells borne by an individual and the character of the body of that individual; they are complementary expressions of the primitive hermaphroditic unity of the organism; indeed, the characters of the sex suppressed in the development of the unisexual gonads are expressed, as it were, in pervasive influence on the soma. (4) So strong is this third antithesis that the male's somatic cells—which the author in a question-begging term calls "parovules"—may be regarded as sexually equivalent to ova; while the female's somatic cells—which the author in another question-begging term calls "paraspermatozoides"—may be regarded as sexually equivalent to spermatozoa. This seems an extravagant and unwarranted hypothesis, and we are quite unconvinced by the facts as to effects of castration, &c., adduced in support of it. But to continue. (5) The properties of the "sexualised" body react on the properties of the germ-cells, in embryonic as well as in adult life, and this in such a definite way that they determine the sexual bias, or the sex of the offspring into which the germ-cells will develop. In short, the sex of the offspring depends on the relative bodily vigour of the parents.

Thus, if a relatively feeble ovum be fertilised by a relatively vigorous spermatozoon, the spermatozoon's qualities will be dominant; the embryo will therefore have (by hypothesis) a masculine or "paraspermatozoid" body, and to balance this the gonads will be female. One naturally wishes to know what the relative vigour of a cell means, and this is discussed in chapter v.; one also wishes to know how the vital force of a parent is measured, and chapter vi. gives the six heads of a complete medical examination. We are relieved to find, however, that the certain sign that a man is more vigorous than his wife is his having a daughter. "Le sexe de l'enfant tranchera la question." Could there be a more conclusive criterion?

In the seventh chapter it is shown that the author's theory fits in well with the phenomena of "crossed inheritance." The son is the result of a more vigorous ovum fertilised by a less vigorous spermatozoon; the somatic cells must balance the gonads, therefore they must be feminine, and, of course, the boy is the image of his mother. Could anything be simpler?

In the eighth chapter the author seeks to show with great ingenuity that the available statistical and experimental results on this difficult subject may be harmonised with his views, and concludes by showing that the so-called auto-regulation of the proportions of the sexes is also explicable on his theory, according to which it is always the more feeble that Nature insists on replacing. If we had space at our disposal we should be delighted to disagree with the ingenuous author in regard to the detailed facts, but it would be of little avail since we cannot admit his postulates. The moral of the book seems good—that the strong man who wishes to have sons must find a still stronger mate; but it also follows, unfortunately, that the weak woman who does not wish

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to have daughters has no resource but to find a still weaker husband. The thesis, if accepted, should beget humility in those male parents who have large families of lusty sons.

J. A. T.

RÖNTGEN RAYS IN MEDICINE AND SURGERY.

The Röntgen Rays in Medicine and Surgery as an aid in Diagnosis and as a Therapeutic Agent. By Francis H. Williams, M.D. (Harvard). Pp. xxxii + 704; 401 illustrations. Second edition, with appendix. (New York: The Macmillan Company; London: Macmillan and Co., Ltd.) Price 25*s.* net.

THE second edition of this excellent work was called for because the first was unexpectedly exhausted within three months, and we congratulate the author upon his deserved success. Only those acquainted with the subject can appreciate how difficult it is for any author to give a correct view of the progress of such a branch of science as the X-rays, because of the great advances made within a comparatively short period, the number of authors engaged in research and the nature of the subject itself. As might have been expected, Dr. Williams fully understands this, because in his preface he states that the work is rather a report of progress than a final presentation of a growing subject. Further, owing to the short time at his disposal for the preparation of a second edition, he has only been able to add some forty pages, chiefly on apparatus and the therapeutic uses of the X-rays. This will be found in the appendix.

Dr. Williams very properly introduces his subject by reference to the principles of physical science, and, without overburdening the student, he tells what is necessary for their appreciation. Next he deals in the most practical way with the equipment necessary for photographic and therapeutic work. Having thus prepared the way, he enters into a full description of the normal conditions of the cavities of the body so that the observer may be able to appreciate deviations from the normal, a principle which will be thoroughly appreciated by all those who are seeking for information from the clinical aspect. The pathological changes are well described by photographic illustrations, diagrams and histories of selected cases.

A noticeable feature of the work is the amount of attention devoted to what might be called the medical aspect of the subject as opposed to the surgical. This is interesting, because for a long time many who believed in the value of X-rays in the detection of fractures, dislocations of the hard structures and foreign bodies were inclined to think that the use of X-rays would be limited to these. If any are still of this opinion we commend them to a perusal of this work.

The third great step in the development of X-rays in medicine was their application in diseased structures, and the present position of their therapeutic action is frankly and fairly stated in these pages.

While it is true that the work gives a very strong representation of the methods employed in America—indeed, the illustrations themselves show that the work has not been produced in any European laboratory—still the labours of others have not been neglected. In future editions the work might be enhanced in value by a reference to what has been done in this country and the European schools of medicine, a fact which is admitted by the author in his preface, because he states that he had intended to include as complete a list as possible of the publications on the subject. This was not found possible on account of its extent, so he adds that had he foreseen this he would have referred in the text to many other important papers.

The work is well written by one thoroughly familiar with the subject, is profusely illustrated, and to those who desire a guide to the study of the subject the work may be thoroughly recommended; and this remark applies to students and practitioners.

OUR BOOK SHELF.

Elementary Geometry. By W. C. Fletcher, M.A., Head Master of the Liverpool Institute; late Fellow of St. John's College, Cambridge. Pp. 80. (London: Edward Arnold, n.d.) Price 1*s.* 6*d.*

THIS is a very small book and a very good one. Its object is to teach geometry to boys without hindering and wearying them with metaphysical subtleties, or requiring them to express the proofs of propositions with that pedantic recitation of details—that parody of logical accuracy—which has long been identified with the study of Euclid.

The author is perfectly correct when he says that his little book "contains the whole substance of Euclid i.–iv. and vi. except the elegant but unimportant proposition, iv. 10."

The branches of the subject are taken in the following order:—Angles, triangulation (*i.e.* the discussion of the properties of triangles), quadrilaterals, loci, proportionals, circles, tangents, areas, maxima and minima, this last section being very short and merely illustrating what is meant by a maximum or a minimum. There is no formality whatever in the proofs, the most simple propositions being often left to the student with a hint sufficient for the solution. Each section, besides terminating with a number of simple exercises (well within the power of the beginner), contains a number of numerical illustrations to be worked by actual drawing with instruments. This is precisely the kind of teaching which is now being advocated by those who have taken up the question of the reform of mathematical teaching.

In propositions relating to proportion—as, for example, that a line drawn parallel to the base of a triangle divides the sides in the same ratio—the author explicitly states that he assumes two magnitudes to have a common measure, and that the difficulty which arises in the case in which they have not "had better be disregarded for the present." The reason for thus making an *essential* difference between "commensurable" and "incommensurable" quantities of the same kind is not obvious, since any proposition which holds for the former will be admitted, even by the beginner, to hold for the latter when it is pointed out that the unit magnitude may be taken so small that the distinction between commensurable and incommensurable quantities practically disappears. The proposition that the sum of two sides of a triangle is greater than the third is proved by the definition of a right line as the shortest distance between two points. The nature of a tangent as the limiting position of a chord is that which the author adopts. This also is in accordance with modern notions, and it offers no difficulty whatever even to the merest beginner. In p. 42, line 4, for "place them so that two pairs of sides are parallel,"

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